International Atomic Energy Agency

BOARD OF GOVERNORS
GENERAL CONFERENCE

GOV/INF/814-GC(41)/INF/2
27 May 1997

GENERAL Distr.
Original: ENGLISH

IAEA DRAFT MEDIUM TERM PERSPECTIVE 1998-2003

1. Attached is the draft Medium Term Perspective (MTP) for the period 1998-2003.

2. Since 1992 the Policy Making Organs have periodically considered the medium term direction of the Agency's activities based upon medium term plans prepared by the Secretariat - the most recent being the draft Medium Term Plan 1995-2000 which was contained in a Note by the Secretariat of 21 December 1993. In June 1994, the Board concluded that as the plan was an internal document, no particular action was required. However, it requested the Secretariat to take account of the comments made by Member States in using the plan for the preparation of programme proposals as well as in the preparation of future plans. The plan was conveyed to the General Conference in 1994 for information under cover of GC(XXXVIII)/11.

3. The process of preparing a document on the medium term outlook of the Agency, and the opportunity it provides for receiving the views of Member States, help to provide a better basis for the preparation of well considered biennial programme and budget proposals.

4. To reflect more accurately the content, this document has been renamed the Medium Term Perspective. The document contains the Secretariat's perception of the evolving demands on the Agency and the possible responses that can feasibly be taken. While the Medium Term Perspective is essentially the product of internal review processes, elements of it were based upon or reviewed by expert advisory groups.

5. It is recognized that some events not foreseen in past medium term plans have resulted in significant changes in the Agency's work. These include the accident at Chernobyl, the advent of a new political situation in central and eastern Europe, requests for radiological assessments of previous nuclear weapon test sites, the role assigned to the Agency by the United Nations Security Council in connection with the situation in Iraq, and the request from a nuclear weapon State for the Agency to carry out verification activities in connection with nuclear material removed from military programmes. Such changes in circumstances, as and when they occur, will be taken into account in the biennial programming process.

6. The draft Medium Term Perspective was considered by the Administrative and Budgetary Committee of the Board of Governors in May and will be further considered by the Board in June 1997 and is also made available to the General Conference for information.

IAEA DRAFT MEDIUM TERM PERSPECTIVE: 1998–2003

1. To organize its work, the Agency has adopted for the 1997–1998 biennium a programme and budget structure which consists of the following six major programme areas:

- Nuclear Power and the Fuel Cycle
- Nuclear Applications
- Nuclear, Radiation and Waste Safety
- Verification and Security of Nuclear Material
- Management of Technical Co-operation for Development
- Policy Making, Co-ordination and Support

The draft Medium Term Perspective follows this major programme structure so as to strengthen the link with the biennial programme cycle.

GENERAL FRAMEWORK FOR AGENCY ACTIVITIES TO THE YEAR 2003

2. The following factors relating to nuclear matters seem likely to influence the direction of the Agency's programmes over the next five years:

- a growing need for effective and efficient international verification of compliance with non-proliferation obligations and of other arms control and disarmament measures
- expanding commitments to the transparent and verified management and utilization of nuclear material released from weapons programmes
- the continuing national and international debate on how to reconcile a growing demand for energy with global and local environmental concerns, and, in this context, the contribution of nuclear power
- the continuing need for the highest levels of nuclear safety worldwide
- a rapid increase in waste and spent fuel management experience and the need to demonstrate long term disposal options
- a widening interest in life extension, decommissioning and site restoration
- the increasing role of the private sector in the development of nuclear power technology and its implementation, and declining public sector resources for nuclear power research
- diminishing direct governmental financial support for many nuclear research centres: the development of nuclear applications progressively passed to "non-nuclear" sectors, public and private, demonstrating their acceptance as mature tools for a wide range of applications

— a continued interest in the effective development and transfer of nuclear technology under Agency auspices to meet national and international sustainable development priorities.

3. The following institutional factors seem likely to influence the operation of the Agency:

— the continued desire of Member States to limit their overall financial commitments to the United Nations system, with consequent pressure to contain the regular budget costs of individual organizations
— the growing pressure for streamlining and consolidation of the international system through changes in the mandates of organizations and by closures and mergers
— increasing competition amongst international institutions for scarce resources, side by side with continuing pressure for closer collaboration amongst them and the avoidance of duplication
— a renewed interest in innovative funding arrangements for some components of the international system, e.g. direct payment for services
— the expectation of a new management culture with reduced overhead costs and increased transparency and accountability
— a growth in regional and subregional arrangements, including some which deal with matters covered by the Agency's mandate, e.g. safety and technology transfer
— increasing contacts between intergovernmental and non-governmental organizations
— a trend to assign additional responsibility for advancing international objectives to private sector mechanisms.

4. While there continue to be shifts in emphasis within and between Agency programmes and subprogrammes, only minimal redirection of resources has occurred in recent years. This has been due to the general acceptance by Member States that the ratio of budgetary resources allocated to safeguards and non-safeguards activities should be maintained, and the view that within programme areas the existing balance between the various interests and priorities of Member States is reasonable. As against this tendency there is a general wish amongst Member States to see the Agency respond more effectively within the regular budget to emerging priorities, particularly through the phasing out of programme areas which may no longer warrant high priority attention. It has, however, proved difficult to achieve a broad based agreement on the identification of such areas.

Resources and Management

5. Despite many years of zero or near zero real growth in the regular budget, the Agency's activities have increased substantially as new high priority programmes continue to be introduced. This has been made possible by: increased efficiency and imposed savings; the provision by Member States of increasing resources outside the regular budget, for example in the form of cost free experts, through national safeguards support programmes and in the form of voluntary contributions; and the direct or indirect payment for services, especially in the areas of safety and verification. Resource constraints are expected to

continue in the area of technical co-operation funding, but new approaches will be explored to encourage full payment of contributions by Member States and to attract resources from non-traditional donors.

6. Continuing serious budget pressures are foreseen, especially in the area of verification. The strengthened and more efficient safeguards system is expected to bring cost neutrality per unit of material safeguarded only in the medium term. In addition, there will continue to be an increase in the quantities and type of nuclear material to be safeguarded, and in the number of facilities, with consequent rises in costs. It is also evident that major new activities resulting from further arms control and disarmament agreements will require substantial additional resources if the Agency is to undertake a verification role.

7. New demands being placed on the Agency will require additional resources: through either increases in the regular budget, or new funding mechanisms or growth in extrabudgetary funds.

8. There will be continued efforts to implement efficiency gains and to identify areas of activity where changed circumstances and priorities enable programmes to be transferred to other organizations, reduced or phased out. The Medium Term Perspective seeks to contribute to this objective. Enhanced attention to programme management and evaluation will provide an improved basis for judgements on these issues. Ultimately, however, decisions about programmes rest with Member States.

MAJOR PROGRAMME 1: NUCLEAR POWER AND THE FUEL CYCLE

9. The Agency's activities in the field of nuclear power and its fuel cycle will be concerned with the problem of meeting an ever growing world demand for energy against the background of the long term depletion of natural fuel resources and the threat of local and global environmental difficulties arising from the continued use of conventional energy sources. As recognized by the Moscow Summit on Nuclear Safety and Security, nuclear power can continue to play an important role in meeting future world energy demand consistent with the goal of sustainable development. The medium term direction of this Major Programme will be defined by the need to respond to new challenges for nuclear power development and maintain on-going activities of proven and lasting value to Member States.

10. In addition to dealing with nuclear electricity and heat generation, the programme will continue to contribute to work related to safety and safeguards aspects and the non-electricity applications of nuclear energy by taking account of these factors in the design of future plants, facilities and fuel cycle strategies.

11. The outlook for nuclear power and accordingly the Agency's programme directions will be conditioned by the following factors:

- rapid economic growth in many developing countries, leading to an increasing demand for electricity
- environmental factors, particularly airborne pollution and potential global warming, as increasingly important to decisions relating to energy options
- a strong expansion of nuclear power in some regions, notably East Asia
- the difficulties being experienced by some major nuclear power producing countries in establishing fuel cycle and other technical support services (notably eastern Europe and the countries of the former USSR)
- the increased importance of life management, life extension and decommissioning resulting from the rise in the number of aged reactors
- the reduced support in many countries for domestic R&D for advanced nuclear technologies and hence the increased role of international co-operation
- the new opportunities of converting defence materials, technologies and installations to civilian uses (for example the use of some plutonium in MOX fuels; nuclear space technologies for direct conversion of nuclear energy into electricity; and the possible conversion of submarine nuclear reactors and technologies for nuclear power plants in the range of 10–100 MW(e)).

Nuclear Power

12. Against this background, the Agency's effort in nuclear power will be focused on the contribution of nuclear energy to sustainable development, with emphasis on:

- co-operation in design and operational measures aimed at the safe development of nuclear power technology
- assistance to developing Member States in planning and implementing nuclear power programmes
- improving the operating performance and reliability of nuclear power plants through the sharing of experience and information worldwide
- extended use of the PRIS database as an authoritative source of information for statistical analysis of nuclear power plant performance indicators and the basis for standards of excellence
- training and retraining of nuclear power plant personnel
- support to existing International Working Groups addressing particular aspects of current and advanced reactor technology
- assistance to Member States in addressing the problem of potable water shortages by reviewing technical and economic aspects of the use of nuclear power for seawater desalination.

13. Nuclear power programmes in Member States are expected to focus on substantial evolutionary improvements of reactor systems to further enhance their economics, reliability and safety. Through its International Working Groups on advanced reactors, the Agency will

encourage an international exchange of information on non-commercial technology and co-operative research. This will also assist Member States in harmonizing user requirements. Another important function will be to assist Member States in the preservation of key technological data on advanced nuclear power systems.

14. The Agency will also provide a forum for the review of information on the development of newly emerging and special purpose nuclear energy systems such as:

— inherently safe reactors
— accelerator driven and hybrid fusion/fission designs
— liquid metal reactors cooled by lead or lead/bismuth
— thorium fuelled reactors
— ship propulsion and space nuclear power systems.

15. Under the prevailing trends of the commercialization of nuclear power and the decrease in governmental support for R&D work, a co-ordinating role for the Agency is becoming more important and related activities may be intensified. At the same time, work may be reduced in areas that might more appropriately be addressed in industrialized countries by private sector organizations.

Nuclear Fuel Cycle

16. The volume of spent fuel in interim storage at both power and research reactors is increasing and the long term storage of spent fuel in ageing facilities will become an increasingly crucial issue regardless of the management option chosen. The identification and mitigation of environmental, health and safety vulnerabilities of ageing spent fuel will be emphasized and an expansion of activities relating to the exchange of information, experience and advice on technical solutions in this area is expected.

17. The current worldwide increase in operating demands on fuel (e.g. higher burnups, longer refuelling cycle length, load following, and the use of MOX fuel) is accompanied by a reduction in R&D work. Under these circumstances, the Agency's role as a forum for the exchange of information on fuel performance, failure mechanisms, and the modelling of behaviour under normal, transient and accident conditions is becoming even more important for maintaining safe and reliable nuclear reactor operation.

18. Plutonium is produced in nuclear reactors and part of it will be separated from spent fuel in reprocessing plants. Additional large quantities of plutonium are likely to become available from dismantled warheads. Plutonium is a valuable energy source, but also a matter of international concern because it can be utilized for non-peaceful purposes. There is increasing interest in additional international measures related to the production, transport, storage and disposition of separated plutonium. Accordingly, the Agency will establish in 1998 an International Working Group on nuclear fuel cycle options as a mechanism for dialogue among Member States on plutonium and related fuel cycle issues.

Radioactive Waste Management

19. The focus of activities relating to radioactive waste management will be on:

- the collection, assessment and exchange of information on waste management strategies and technologies covering the full range of radioactive wastes arising from nuclear power plants, nuclear fuel cycle facilities, radioisotope applications, research activities and the restoration of sites contaminated with radioactivity
- the provision of general technical guidance, assistance in technology transfer, and promotion of international collaboration in optimizing the development and establishment of technical waste management infrastructures and programmes in Member States
- the examination of the long term prospects of regional waste management facilities to provide new opportunities to developing countries with limited national resources in resolving their waste management problems in a cost effective manner
- the encouragement of technologies for the final disposal of long lived radioactive waste through demonstration and documentation
- the exchange of scientific and technical information in the International Radioactive Waste Technology Advisory Committee (WATAC).

20. The radioactive waste management technologies developed and adopted by nuclear power plants and nuclear fuel cycle facilities can in many cases serve as a reference for wastes from others sources but there is a trend in some Member States to develop separate waste management programmes for each waste generating sector. The Agency will enhance its efforts in the development and establishment of practical waste management strategies and technologies appropriate for waste generated by non-power applications.

21. The countries of the former USSR and eastern Europe are establishing their own legal, regulatory and organizational infrastructures for the management of radioactive waste. These countries will need to proceed urgently with the establishment of their technical infrastructures and programmes, which will have to take into account new regulatory requirements, the legacies from the past, new technologies, changing socio-economic factors and globalization of the markets in the industrial world. In this process the Agency will not only play the role of a provider of general technical guidance but also act as a vehicle for technology transfer.

Nuclear Energy for Sustainable Development

22. Economic and environmentally sound energy systems will be needed to meet the increasing energy demands for sustainable development. Nuclear energy has the potential to play an important role in the future energy mix in different regions. The objective of the comparative assessment programme is to define optimal strategies for the development of the energy sector, consistent with the aims of sustainable development. Consideration will also be given to energy demand and supply issues outside the electricity sector.

23. The programme on comparative assessment of energy sources will focus on:

— developing and disseminating databases and methodologies for comparative assessment of nuclear power and other energy sources in terms of their economic, health and environmental impacts
— ensuring that the results of Agency supported assessments are made available to relevant national and international forums (such as the Intergovernmental Panel on Climate Change and the United Nations Framework Convention on Climate Change)
— enhancing the capability of Member States to incorporate health and environmental considerations in the decision making process for the energy sector.

MAJOR PROGRAMME 2: NUCLEAR APPLICATIONS

24. In order to meet the needs of the growing world population, it will be necessary:

— to increase substantially world food production over the next thirty years in an environmentally sustainable manner
— make available new sources of fresh water supplies, the lack of which is already limiting development in many regions
— minimize the threat to coastal marine ecosystems from land based pollution sources
— improve health services
— provide for faster industrial development.

In each of these sectors nuclear applications already play an important role and could play an even greater part.

25. The relative priority between, for example, the applications of nuclear techniques in agriculture, the environment and medicine cannot be easily determined. Feedback received from Member States in the regular budget and technical co-operation programming processes, as well as evaluations made of programmes, are not expected to indicate a need for major shifts in emphasis amongst the activities in this Major Programme. The focus of activity will accordingly remain on the contributions of nuclear applications to four areas: environmentally sustainable expansion of food and water supplies and protection of marine ecosystems; improving human health; advances in nuclear science; and environmental monitoring work. Some of the work relating to advances in industrial techniques can increasingly be expected to be taken over by commercial concerns. Agency activities in all the above areas will continue to benefit from an expanding level of support from the laboratories at Seibersdorf and at Monaco.

26. This Major Programme will therefore continue to undertake the following functions:

— promote the development of nuclear techniques through co-ordinated research
— facilitate information and technology transfer by fostering suitable infrastructures

- strengthen national capacities to assess safety and environmental factors and to achieve generally accepted quality control standards
- provide technical advice and support to the technical co-operation programme
- promote cost effective computer based techniques such as interactive training and "distance learning" for the exchange of scientific and technical information and for improving the quality of training
- encourage through information exchange the incorporation of proven nuclear technologies into the mainstream of national development programmes.

27. To perform these functions the Agency will need to maintain the ability to provide advice on new and changing trends in nuclear technology and on the relative merits of nuclear and non-nuclear technologies for addressing particular problems.

Sustainable Food Production

28. In the area of food production and protection, more emphasis will be given to: the question of sustainability; the incorporation of molecular biology techniques into agricultural research and development in the fields of plant breeding, animal health and insect pest control; research on the efficiency of nutrient uptake by plants and the recycling of organic matter in cropping systems; and additional training and laboratory services for the application of molecular biology and other biotechnologies in vegetatively propagated crops as well as forage and feed crops. Work in other areas will be held to current levels or reduced.

29. The emphasis in animal production will change from support for immunoassay methodologies for identifying the constraints on productivity to the use of these methods to measure the effectiveness of interventions, such as vaccination programmes and alternative feed resources.

30. There will be a continuing emphasis, in collaboration with other international organizations, on the use of the sterile insect technique (SIT) for the control or eradication of fruit flies, tsetse flies and caterpillar pests. There will be substantially less research on food irradiation but assistance will continue to be given in relation to WTO provisions for trade in irradiated food. Research on pesticides in the environment and on agricultural countermeasures after nuclear accidents will be reduced.

31. More support will be provided to Member States for monitoring contaminants in food in international trade; and for developing practices which ensure that the level of contaminants which might inhibit trade under Uruguay Round Agreements are kept below levels agreed internationally or set by national legislation. To this end, a training centre and reference service will be established at the Agriculture and Biotechnology Laboratory at Seibersdorf.

Improved Human Health

32. The challenges for the medium term in nuclear medicine are: cost reduction, quality assurance and demonstration of the appropriateness of nuclear techniques to alleviate human health problems. To meet these challenges, the Agency programme will:

— support education of the medical workforce in developing countries in cost effective, high quality, medical applications of radiation
— adapt nuclear technology and procedures to address some important health issues in the coming years, notably malnutrition, cancer, and communicable as well as genetic and degenerative diseases
— increase co-operation with WHO and with regional medical associations.

33. High priority will be given to activities for the improvement and dissemination of radiotherapy technology. New technologies such as brachytherapy using short lived isotopes and therapies using radiopharmaceuticals will be introduced in research projects and technology transfer activities.

34. In dosimetry, the role of the IAEA/WHO network of Secondary Standard Dosimetry Laboratories (SSDLs) in providing TLD quality audits of the dose delivered to radiotherapy patients will be strengthened. New radiation standards for therapy and for diagnostic X rays will be disseminated through SSDLs to hospital users.

35. Activities on methodological aspects of radioimmunoassay and quality control of planar gamma cameras will be phased out so as to allow inclusion of the quality control of single photon emission computer tomography cameras. New applications in nuclear medicine for the diagnosis of diseases will be compared with non-nuclear methods. Computer assisted learning of nuclear medicine procedures will be emphasized.

36. Isotopic tracer techniques are useful for predicting the long term benefits of programmes to overcome malnutrition. The focus in Agency work will shift away from research studies to the practical use of isotopes as tools for improving the sensitivity of nutrition monitoring techniques, and for identifying effective food and nutrition strategies.

37. Nuclear and related techniques already established in nuclear research centres in developing countries will continue to be used to assess local radioactive and non-radioactive environmental pollution.

Cleaner Marine Environment

38. Marine ecosystems are vital to global food supplies: roughly one billion people, most of them in developing countries, depend on fish for their main source of nutrients and more than half the world population live in coastal zones. Eighty per cent of all marine pollution is caused by human activity on land. International action on the protection of the marine

environment from land based activities is being co-ordinated under a new Global Programme of Action — and relevant parts of the Agency's activities will be conducted within that framework.

39. Against that background the Agency's marine environment programme will emphasize:

- studies of non-nuclear contaminants using isotope methodology
- understanding marine pollution by organic compounds such as oils, sewage and fossil fuel combustion products
- determining key processes in the transport of carbon to the ocean depths
- the development, with other United Nations agencies, of a comprehensive computer based system for mapping, analysing and forecasting land based marine pollution
- the use of new methodologies to allow on-site radioactivity monitoring with satellite data transmission (thus allowing continuous survey of remote locations)
- the use of a new generation of submersible detectors mounted on remotely operated vehicles to permit detailed inspection of seabed radioactivity
- new work on the assessment of the consequences of the sea disposal of radioactive wastes and of nuclear accidents at sea
- provision of support for technical co-operation activities in capacity building in Member States to meet emerging marine environmental challenges.

Safe Water Supplies

40. Integrated planning and resource management covering the whole water cycle is vital to the goal of sustainable development in many parts of the world. The Agency's hydrology activities will therefore focus on the use of nuclear techniques in: the management of water resources in regions suffering from water scarcity; assessment of water pollution in high density urban environments; exploration and management of geothermal resources; and the increasing understanding of climate changes and their impact on the water cycle.

Industry and the Environment

41. A variety of nuclear techniques are being used to improve industrial productivity and minimize environmental hazards. Radiation processing technology has been introduced in many Member States for sterilization of medical products and food preservation and for processes in the cable and wire industry and is being increasingly recognized as an effective method for reducing environmental pollution, as with flue gas purification in coal thermal power plants. Future work in these areas will focus on:

- the reduction of environmental degradation through radiation treatment of industrial waste gases, including flue gases from power plants, waste water and sewage
- production of short lived isotopes to minimize radiation exposure to patients undergoing diagnosis and therapy.

42. The Agency will phase out work on those industrial techniques which are taken up commercially.

Utilization of Nuclear Research Capacity

43. The Agency will continue to assist Member States in their efforts to make more effective use of their research reactors and particle accelerators for research, isotope production and industrial applications.

44. As a result of Agency assistance to many developing countries, the situation in regard to the availability, maintenance and trouble-free operation of nuclear instruments has improved considerably but this area needs continued attention. Access by developing countries to emerging radiation technologies will be facilitated. New activities will include strengthening of national capabilities for the production of modern radiopharmaceuticals for diagnosis in cardiology, neurology and oncology.

Nuclear and Atomic Data

45. The development of nuclear based technology relies on the availability of accurate nuclear, atomic and molecular data describing the underlying physical processes. By focusing on the most critical current needs, Agency activities in this area ensure that the key data required to support nuclear technology are readily available, free of charge, to all Member States. The Agency's involvement in the collection and provision of data will give priority to the areas of medicine, radiation safety, transmutation technology, fusion and safeguards.

Fusion Research

46. Plasma physics and controlled nuclear fusion research will be a significant field of international endeavour during the medium term. The Agency will continue to assist the International Thermonuclear Experimental Reactor programme as necessary. The operational and environmental safety aspects of future fusion reactor concepts will be emphasized. Research on innovative fusion concepts will be encouraged. Industrial applications of plasma technologies will be promoted.

MAJOR PROGRAMME 3: NUCLEAR, RADIATION AND WASTE SAFETY

47. The objective of this Major Programme is similar to, albeit broader than, the first objective of the Convention on Nuclear Safety: to achieve and maintain a high level of safety worldwide through the enhancement of national measures and international co-operation. The Agency will be conscious of the changing environment but its approach will remain conceptually unchanged. The first element will continue to be to establish or adopt standards of safety for the protection of health and minimization of danger to life and property. This will be accomplished in collaboration with the competent organs of the United Nations and its specialized agencies. The second element will be to provide for the application of safety standards through co-operation with national authorities.

48. The declaration of the April 1996 Moscow Summit reiterated that safety is the first priority in nuclear activities and that international conventions will be major instruments in achieving safety. Furthermore, it is to be expected that safety targets will continue to rise and this will require continuous effort and vigilance by Member States and the Agency to ensure that adequate levels are maintained.

Safety Standards

49. Further development and updating of Agency safety standards will be the first priority. The standards developed in the 1970s represented the maximum international consensus which could be reached at that time. The revision/preparation process already started in 1996 will be the vehicle for producing documents that reflect the present status of nuclear, radiation and waste safety. This is also in line with the spirit of the conventions on nuclear and waste safety and with the need for references on which to base the safety judgements made by the reviews conducted under the conventions.

Safety Services to Member States

50. The Agency must continue to respond to requests from Member States for a variety of services. The nature of the services provided for nuclear power plants and research reactors is not expected to change significantly. The current trend to place increasing emphasis on self-assessment by institutions rather than assessment by external peers will continue. Increased emphasis is foreseen on research reactor safety as the population of these reactors continues to age and the need increases for their rehabilitation, modernization or decommissioning. The demand for services is expected to shift more towards Asia, where a number of new countries will enter at least the planning stage for major nuclear installations.

51. In the radiation and waste safety areas, increased activities are expected in connection with:

— restoration of contaminated areas
— development of safety requirements for the decommissioning of obsolete facilities
— assessment of chronic exposure situations
— assessment of impacts on the environment.

52. With the limited resources and predicted increases in the demand for services, improvements in efficiency and effectiveness will be required. A key element will be co-operation with Member States to develop where appropriate country safety profiles to ensure that the needs of Member States are defined and that the appropriate services are provided.

Strengthening of Infrastructures for Safety

53. Although the prime responsibility for safety lies with the holder of a licence, the regulatory body is essential in defining the legislative and regulatory framework for the industry. It is also of vital importance in ensuring that holders of licences assume their responsibility vis-à-vis the safety of the installations and the control of radioactive sources.

54. The Agency will support Member States through information exchange on technical issues and will promote the adoption by Member States of complete sets of laws and regulations and the development of rigorous licensing processes.

55. In the period 1999–2000 there will be a need to evaluate the progress made in implementing the model project on upgrading radiation and waste safety infrastructure. In particular, the extent to which the goals set for the 1996–1997 period in the more than 50 countries involved will have to be analysed and the programme adjusted accordingly.

Implementation of New Conventions

56. Although the Agency has a limited role in the review process for the Convention on Nuclear Safety, it can be expected to receive more requests for review services, for example in relation to the preparation of inputs for national reports. Depending on the outcome of the first review meeting of the contracting parties, the Agency might be requested to take a larger role either in the preparation for meetings or even in preparatory work for the reviews themselves.

57. The convention on radioactive waste and spent fuel is expected to enter into force prior to 2000. While the role of the Agency will be limited, a likely impact is increased requests for assistance from Member States to meet their obligations.

Co-operation with International Bodies

58. A basic aim will be to maintain a clear functional relationship with the international bodies that can provide an input to the Agency's process of setting standards. These include the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP) and, to a lesser degree, the International Commission on Radiation Units and Measurements (ICRU).

59. Other United Nations bodies with related interests are the ILO, WHO, IMO and UNEP. The Agency will continue to be aware of international conventions and standards developed through these bodies to ensure that consistency is maintained with the Agency's own standards. The current trends towards increased requirements for protection of the environment and controls on transboundary movements of hazardous materials in international conventions and treaties will be carefully followed. The Agency will ensure that the technical positions with respect to the hazards presented by radioactive sources, packages and discharges are accurate and properly presented in documents produced by other United Nations bodies.

60. The World Association of Nuclear Operators has objectives that overlap those of the Agency; close collaboration will be maintained, in particular in the provision of operational safety assessments, permitting a reduction in Agency activities in this area..

61. The Nuclear Energy Agency of the OECD makes a significant contribution to safety in nuclear activities. The Agency will continue to collaborate with the NEA to ensure that the programme of the two agencies are complementary rather than duplicative, especially as the NEA continues to expand its membership and its activities in non-OECD countries.

MAJOR PROGRAMME 4:
VERIFICATION AND SECURITY OF NUCLEAR MATERIAL

62. The Agency plays a vital role in operating an international safeguards system that serves the overall objective of the non-proliferation of nuclear weapons. It also provides services designed to strengthen the physical protection of nuclear materials and to combat the threat of illicit trafficking in such materials. The effectiveness of these activities will be maintained to ensure a continuing basis for trade and co-operation in the nuclear field and to provide the confidence ultimately necessary for broader nuclear disarmament.

63. The discovery of a clandestine nuclear weapons programme in Iraq, the continuing difficulty in verifying the initial report of the Democratic Peoples Republic of Korea and the decision of the South African Government to give up its nuclear weapons programme and join the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) have all played a role in the launching of an ambitious effort by Member States and the Secretariat to strengthen the safeguards system and make it more efficient. The dissolution of the USSR resulted in 14 newly independent States, many with significant nuclear activities. Like Argentina and

Brazil, these countries have accepted comprehensive safeguards. The NPT was indefinitely extended in 1995. Against this backdrop of high expectations and additional burdens, the Agency's verification activities continue to operate under severe financial constraints.

64. High priority will be accorded to the implementation of the Agency's programme for strengthened and more efficient safeguards to provide: additional assurances about the exclusively peaceful use of nuclear technology; and a higher level and a different kind of co-operation with State and regional systems, including a sharing of information and resources.

65. Agency verification activities are based on formal legal obligations agreed between the Agency and States. High priority will be given to the conclusion of the new instruments required in connection with Programme 93+2; and work will continue on concluding other instruments, some of which are long overdue.

66. Improved efficiency will be pursued in a number of areas — particularly through the use of advanced technologies -— to release resources required for the implementation of the newly acquired access to information and facilities:

— priority will be accorded to the further improvements in conventional material accountancy, particularly on direct-use material and large facilities: more timely reporting on facility operations and material movements necessary to support the implementation of near-real-time accountancy methods, improved methods for the analyses of safeguards samples and increased utilization of process monitoring
— the combination of increased co-operation with State systems for accounting and control (SSACs), unannounced inspections, and improved surveillance with remote transmission of video records and seals information will give increased efficiencies without sacrificing effectiveness
— the collection and analysis of environmental samples should lead to more effective and efficient safeguards. In the medium term, regional centres of excellence established by Member States may well develop the capability to handle such ultra-sensitive methods of analysis and thus contribute both capability and capacity.

67. Major increases in the coverage and volume of safeguards have occurred in recent years. Of the 14 newly independent States resulting from the dissolution of the USSR, 13 had acceded to the NPT by the end of 1996. The comprehensive safeguards agreements for those States with significant nuclear activities on their territory and under their control have entered into force (or, in one case, is awaiting ratification) and the verification of initial reports and the implementation of safeguards has begun. These States had no previous experience with the legal and technical requirements of the Agency's safeguards system. The costs for implementing safeguards in the newly independent States have been offset to date by facility closures elsewhere and savings made through the implementation of the New Partnership Arrangements with EURATOM.

68. Quantities of nuclear material subject to safeguards continue to grow and the quality of material will change with the expected increased use of MOX fuels. In addition, there is the likelihood of a gradual increase in the overall number of facilities subject to safeguards.

While some of these effects could be offset in part by decreasing effort required for establishing initial inventories (because fewer States will be concluding comprehensive agreements), the overall expectation is for steadily increasing requirements for safeguards efforts and consequently for safeguards resources.

69. Additional verification activities by the Agency in support of disarmament initiatives began in 1994 under the Voluntary Offer Agreement between the Agency and the USA whereby safeguards are applied to several stores of direct-use materials that have been released from weapon programmes. Extrabudgetary contributions cover the Agency's costs. The Russian Federation has also declared its intention to place weapon-origin nuclear materials under Agency verification. Further, trilateral discussions between the USA, the Russian Federation and the Agency are expected to result in a new set of arrangements involving verification by the Agency that nuclear materials from the defence sector remain removed from nuclear explosive programmes. In the future, a "cut-off" agreement will probably call for verification by the Agency.

70. The implementation of treaties establishing nuclear-weapons-free zones and other regional mechanisms are likely, in the medium term, to lead to the Agency being entrusted with additional verification tasks in an ever more complex verification environment.

71. The threat of illicit trafficking in nuclear materials entails both public health and non-proliferation risks. The Agency's programme will: seek a strengthening of physical protection in Member States to combat such trafficking; assist them in improving national capabilities to detect its occurrence; disseminate reliable information on reported cases; and encourage international co-operation to these ends.

72. Non-proliferation and nuclear disarmament will continue, in the medium term, to be high priority issues debated in a variety of public forums. The Agency will contribute to these debates through its expertise with the technical, legal and political dimensions of verification in the nuclear environment.

73. Severe resource constraints on this programme are expected to continue. In the medium term the costs per unit of material safeguarded in the strengthened system can probably be contained to a small increase and subsequently reduced to current levels. This notwithstanding, the Agency will require additional resources as the demand for safeguards continues to grow through the expansion of nuclear programmes, higher expectations placed on the strengthened safeguards system, and new verification tasks in connection with disarmament initiatives. In the past the gap between regular resources and the needs of the verification and security of materials programme has been met by increasing reliance on extrabudgetary and in-kind support. However, equitable and reliable funding mechanisms will be required in the future to permit the Agency to meet its growing responsibilities in this area.

MAJOR PROGRAMME 5:
MANAGEMENT OF TECHNICAL CO-OPERATION FOR DEVELOPMENT

74. An important part of the Agency's technology transfer work is carried out through the technical co-operation programme, with support and direct participation from the technical and scientific programmes. The complementary nature of the work may be expected to increase: for example, as safety standards become accepted, efforts will be directed to providing support for their implementation, and as nuclear techniques become established, efforts will be directed to their transfer.

75. During the last few years the emphasis of the Agency's technical co-operation programme has gradually shifted from activities aimed at building national nuclear capacities to those employing this capacity for productive and sustainable national development. This change implies responsibilities, functions and resources beyond the Agency's traditional role, including new partnerships with Member State counterparts and, through them, with other governmental agencies, international development organizations and possibly the commercial sector. This goal is reflected in the term "partner in development" and underlies the objectives of the new strategy for technical co-operation.

76. The programme will concentrate on nuclear applications which are expected to result in the greatest social, economic or environmental benefit, taking account of the international consensus achieved in Agenda 21 and other United Nations system objectives, for example the needs of the least developed countries (LDCs). Safety remains a basic prerequisite and the goal is to have basic safety infrastructures in place for all Member States by 2000. Other safety matters may need to be given priority as experience is acquired with the implementation of the nuclear and waste safety conventions.

Operating Environment

77. Possible constraints and opportunities to this new direction include:

- the availability of resources to the programme through the Technical Co-operation Fund (TCF) and extrabudgetary funding: project proposals from Member States will continue to exceed resources available and priorities will need to be set
- constraints on the regular budget resources for management of the technical co-operation programme: despite continuing efficiency gains, these could hamper progress
- the trend amongst Member States to emphasize the private sector as the engine of development: this is consistent with the Agency's focus on end-users.

Technical Co-operation Strategy

78. The experience already acquired with model projects has demonstrated improvements in terms of impact on end-users and improved cost sharing commitments, as well as an improved awareness of the utility of performance indicators and better assessment of the feasibility of projects. The new strategy will build on these achievements and help ensure further qualitative improvements through: adherence to: model projects, country programme frameworks (CPFs) and thematic planning; technical co-operation among developing countries (TCDC) and co-funding; the use of targets and success criteria; and an internal management plan for implementing the strategy.

79. The model project approach, involving greater emphasis on end results, detailed work plans and performance indicators, will be extended to the entire technical co-operation programme. At the same time the programme will continue where required to help build scientific and technological capacities to meet identified developmental objectives.

80. The CPF process — a joint effort between the Agency and a Member State to identify priority areas of application of nuclear technologies that are in line with the country's needs — will become the key programme planning tool.

81. Thematic planning, involving the assessment and promotion of nuclear applications which have demonstrated significant benefit to Member States, will become one of the main mechanisms for assigning priority to project activities.

82. TCDC will continue to be emphasized. The Agency will play a growing role in fostering partnership among developing Member States, including the least developed countries, by utilizing the nuclear facilities, capabilities and experience available in these States. Regional co-operative agreements (RCA, ARCAL and AFRA) will be strengthened through expanded Member State participation in and responsibility for all stages of project management.

83. To increase the resource base of the technical co-operation programme and facilitate interaction with end-users, the new strategy involves greater participation of international and national development organizations in partnerships beyond the Agency and the Atomic Energy Commissions or equivalent bodies in each Member State. Attracting new funding sources through links with bilateral donor agencies will require further improvement of project design and management, and greater fund raising efforts.

Other Issues

84. Additional issues which the Agency (and SAGTAC) will address include:

— the review of the Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance will have to consider the special needs of LDCs and the criteria for eligibility for TCF funding.

- a proposed cautious increase in the use of third party implementation of technical co-operation projects to both promote TCDC and improve the efficiency of operations will require a new policy and operational framework and a system for accountability for the programme standards set by the Agency.
- involvement of the private sector is a new element in some national projects. The Agency has only limited experience in dealing with the private sector on project matters and is developing its approach on a case-by-case basis. While the role of the private sector in the identification, formulation and financing of projects is a matter for national counterparts to determine, the Agency will need to develop guidelines based on experience acquired.
- environment impact assessment has become a standard requirement for project appraisal for many national and international development agencies and contributions from some donors may be linked to such assessments. While the model project criteria include sustainability, specific guidelines for assessing environmental impacts will be set.
- the balance between the purchase of equipment and the provision of training and expert services will be further studied and policies developed.

MAJOR PROGRAMME 6: POLICY MAKING, CO-ORDINATION AND SUPPORT

85. The overall operating environment of the Agency, and the increasing demands imposed upon it, require that the overriding concern of Major Programme 6 will be to provide leadership in ensuring programme effectiveness and accountability, adequate financial resources for the Agency as a whole, and effective and efficient provision of policy and administrative support.

Executive Management

86. The Agency's programme and organizational structures will be kept under review to ensure that the process of adjustment to new requirements is maintained. The recent strengthening of policy co-ordination and programme planning functions within and among Programmes should generally be appropriate for the medium term as should the current strengthening of the Agency's oversight functions, including internal audit, programme performance assessment and internal management training and consultancy. The Agency, like national institutions, will strive to offer effective international services and demonstrate that the tasks laid upon it are performed more effectively than would be the case by alternative means and that the product is of significance to a wide range of Member States. To this end, a programme evaluation system is being implemented as an integral part of the Agency's work.

Policy Making Organs

87. Maintaining the effectiveness of the Policy Making Organs may require an expanded use of informal subsidiary bodies of the Board of Governors to deal with specific issues. Efforts will focus on the preparation of more concise documentation and its electronic transmission to Member States, with a consequent reduction in the volume of printed material.

External Relations, Legal Services and Public Information

88. Demand for the services provided by the External Relations, Legal and Public Information programmes (including responsibility for the implementation of certain programme activities and support for a wide range of other Agency activities) can be expected to increase. In particular, there may be a growing need for policy support and legal advice in relation to new regional institutions, implementation of new safeguards measures, new nuclear verification roles, and the development of legal instruments and nuclear safety infrastructures. A targeted public information programme will seek to improve understanding of and support for the Agency's specialized services, particularly in the areas of safeguards, safety and sustainable energy options.

89. The Legal Programme will continue to encourage adequate national and international legal infrastructures for the safe and peaceful uses of nuclear energy. The international legal framework has been enhanced in recent years by the development of new instruments, particularly in the areas of safety, safeguards and liability. With the conclusion of work on these new instruments the focus will be on:

- promotion of adherence to and implementation of existing instruments
- extension of international legal framework o cover the safety of research reactors and fuel cycle operations
- the cycle of review of existing instruments
- the conclusion of protocols to comprehensive safeguards agreements, the framework for verification activities in nuclear weapon States and the verification regime for the proposed treaty on the cessation of the production of fissile material for weapons use
- the formal relationship that may need to be established with new arms control verification regimes
- systematic support for and advice on the establishment of national legal infrastructures.

Financial management

90. An overriding consideration will be to ensure an adequate Agency resource base to finance the expected programme activities. Some aspects of the challenge in this area have been noted above, in particular in relation to safeguards. The reliance on extrabudgetary resources will be monitored and efforts made to ensure that key obligations and activities

have adequate and reliable funding. The cash flow situation will be monitored and continued efforts made to recover the large volumes of arrears in contributions and to maintain an adequate working capital fund. New funding mechanisms will be evaluated in the event that major new programmes are undertaken (for example in the area of verification).

91. Improvements will be made in the internal systems supporting the harmonized programme accounting systems so as to provide timely and authoritative information and analysis that meets the needs of programme managers.

Personnel Management

92. The recruitment of the highest quality staff will remain essential, and vigorous efforts will continue to ensure as wide and balanced a geographical distribution as possible, with special emphasis given to the recruitment of women. The deteriorating conditions of United Nations system employment (which the Secretariat will seek to redress) and the reduced numbers of graduates in nuclear related disciplines in many countries will add challenge to the recruitment environment. While scientific excellence will remain the goal, there will be increased emphasis on managerial abilities. For appointments relating to specialized tasks the contracts will be explicitly short.

93. Planning and control of the Agency's human resources will require greater attention to ensure that the deployment of staff matches programmatic requirements. The increasing use of shorter term, project specific personnel and, most likely, of extrabudgetary staff will need monitoring to ensure that distortions do not arise. Management approaches will focus on targeted training in programme and resource management, including staff performance appraisal. It is expected that new mechanisms will be introduced for recognizing and rewarding excellence in a work environment which will continue to offer few promotion prospects. Staff will be encouraged to acquire a fuller understanding of and to make a more informed contribution to the goals of the Agency. This will involve greater communication at all levels between different organizational units.

Services and capital equipment

94. Responsibility for the buildings management, operation and maintenance of the Vienna International Centre will continue to be shared with the other tenants. As some of those other organizations reduce staff numbers (through reorganization or relocation) there could be changes in the cost sharing and management arrangements. There is an expectation that general maintenance costs will rise gradually with the age of the VIC facilities. The Agency will need further additional office space if it is to acquire major new responsibilities, with a consequent increase in the Agency's share of common operating costs.

95. Capital equipment costs are expected to remain high, owing primarily to ongoing replacement of the computer and telecommunications infrastructure. The provision of the Equipment Replacement Fund should provide an adequate mechanism for foreseeable major computer costs.

Information Management and Support

96. Between 1997 and 2003 the enhanced communications capability ("information highway") will dramatically increase the availability of information and the potential for its electronic management and distribution. This will require adequate attention to both the management of information, and a prudent programme of information technology enhancement.

97. In the next five years the emphasis will be on the development of Agency-wide technologies that make relevant information more easily available to users. The technology areas that will be emphasized in the medium term include: developing a communications centred infrastructure; exchanging information electronically, internally and externally; and improving efficiency. Further, the Agency's use of the Internet technology will be expanded, especially for collaborating with external counterparts.

98. There will be a major shift in Library activities from the acquisition of reference material to the provision of electronic access to information.

99. A strategic plan for the future development of INIS aims at: cost reduction for participating members preparing input to the database by the simplification of various procedures; and partnerships with other organizations to improve efficiency and eliminate duplication of effort by establishing gateways to related nuclear information not "owned" by INIS but available elsewhere and by negotiating agreements for document delivery of nuclear literature available elsewhere.

ANNEX
Indicators of Success

The following list of indicators of success in the Major Programmes represents an attempt to set criteria for assessing the success of the Agency's work over the coming five-year period. Since the present document concentrates more on broad strategies than on detailed projects, it has been difficult in some cases to formulate the indicators in a manner which is sufficiently precise to be of practical application. However, the Secretariat believes that the effort to try and define indicators is of value both to internal planning and evaluation procedures and to Member State review of the significance of the Agency's programme. More precise indicators will be developed at the subprogramme level for presentation in the programme and budget document.

Major Programme 1

- *effective technical support provided for countries planning or implementing nuclear power programmes*
- *increase in the number of countries using Agency developed comparative assessment techniques for their energy policy analysis*
- *support provided for demonstration and documentation of nuclear waste management technologies and disposal solutions*
- *international measures developed and implemented for effective management and utilization of plutonium, particularly from former weapons programmes*
- *effective co-ordination established within the United Nations system and other relevant international organizations in promoting sustainable energy options.*

Major Programme 2

- *results of research, development and information sharing activities consistently found to be relevant to priority concerns of Member States*
- *timely and effective support provided for technology transfer through the technical co-operation programme*
- *co-ordinated research increasingly directed to topics which are expected to bring tangible benefit to end -users.*

Major Programme 3

- *Requirements and Guides for nuclear power plants updated by the end of 1999*
- *Requirements and Guides for research reactors prepared/updated by 2001*
- *RADWASS standards series completed by 2001*
- *WASSAC standards series completed by 2001*
- *process in place to review/revise each document at least once every seven years*

- *establishment of a country safety profile for Member States involved in technical co-operation projects*
- *timely response to all requests for services that are a priority in a country and which cannot be met by State or industrial services*
- *increase in the number of States with complete sets of laws and regulations relating to radiation and waste safety*
- *improvement of State capabilities for licensing, inspection and enforcement*
- *ability to supply services requested by Member States to assist in meeting obligations*
- *analysis by 2001 of the results of the first Review Meeting of the Convention on Nuclear Safety and if required preparation of any necessary guidance documents*
- *increase in the number of standards that are jointly prepared and approved by the Agency and other international organizations*
- *formal procedures established to govern the relationship between the Agency and other organizations*
- *OSART missions reduced as more are carried out by WANO.*

Major Programme 4

- *all approved provisions to strengthen the Agency's ability to detect undeclared nuclear material, facilities and activities introduced for use on a routine basis*
- *the safeguards evaluation and reporting process revised to reflect the conclusions derived from the new measures and approaches*
- *conclusion of outstanding agreements and protocols*
- *greatly reduced backlog of subsidiary arrangements*
- *new safeguards approaches developed for complex, large scale facilities*
- *remote monitoring and transmission of safeguards data in routine and widespread use*
- *unit costs of safeguards held* at or below *current levels while effectiveness is increased*
- *suitable verification techniques developed and demonstrated through a programme of co-ordinated research and development with Member State*
- *the Agency's ability to respond rapidly to new challenges (such as verification in nuclear-weapon-free zones) demonstrated*
- *the Agency's programme on combatting illicit trafficking recognized as an effective service to Member States*
- *an enhanced programme of information exchange activities in place, designed to ensure broad understanding of the Agency's role and expertise amongst policy makers, and academic and other institutions concerned with arms control and international security, especially in developing Member States.*

Major Programme 5

- *model projects under way in about two-thirds of all recipient Member States by the year 2000*

- *the core elements of the model project concept — orientation towards the end user, cost effectiveness and impact — established as the dominant consideration in the appraisal of the majority of project requests by the year 2000*
- *by the year 2000, formally agreed CPFs prepared or in preparation for half of recipient Member States*
- *by the year 2000, thematic plans available for 5–6 subjects and the process used to identify technologies of special value*
- *by the year 2000, responsibility taken by Member States in regional co-operation arrangements for the formulation of their programmes, where applicable in line with model project criteria*
- *by the year 2000, elements of project design such as performance indicators and time-limited objectives established as a normal feature of projects: success criteria set for all major projects prior to approval.*

Major Programme 6

- *effective and transparent oversight and evaluation capabilities established*
- *all Policy-making Organ documentation available in electronic form by the year 2000*
- *major review made of all international legal instruments for which the Agency has responsibility once every ten years*
- *adequate national legal frameworks established in all States with significant nuclear activities*
- *a stable financing base established which avoids the need to borrow funds or cut programmes*
- *replacement of the financial information system to provide information to managers on line*
- *the number of Member States in arrears in contributions reduced*
- *appropriate geographic and gender balance established in the staffing*
- *appropriate balance established between short term specialist staff and longer term staff with the potential for deployment in different areas, including managerial functions*
- *highly motivated, efficient and flexible staff maintained*
- *new mechanisms established to reward excellence in performance*
- *adequate standard of building operation and maintenance in place*
- *cost effective strategies established for changes in information technology and complementary staff efficiency gains realized for the Agency and Member States*
- *improved information management established to ensure timely and targeted availability of information for internal and external use*
- *continued INIS consumer demand and satisfaction.*